DOCUMENT RESUME

ED 166 077 SO 011 337

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TITLE Styles of Research and Scientific Self-Images of Researchers in Four Socio-Behavioral Fields.
PUB DATE Nov 78
NOTE 21p.; Paper presented at Society for Social Studies of Science, Symposia: Social-Psychological Perspectives on Research Style and Career Development (3rd, Bloomington, Indiana, November 3-5, 1978); Appendices may not reproduce clearly due to small print

EDRS PRICE MF-$0.83 HC-$1.67 Plus Postage.
DESCRIPTORS *Behavioral Science Research; *Comparative Analysis; *Competition; Educational Research; Higher Education; Political Science; Psychology; *Researchers; *Research Methodology; Scientific Attitudes; *Self Concept; Social Science Research; Sociology; Theories

ABSTRACT

This study explored competition and styles of research in the fields of education, political science, sociology, and psychology. The paper is based on a theory which considers science as a competitive activity. Basic, non-applied, experimental, and "high qualitative" research styles are considered more advantageous to competition because (1) they enable researchers to work simultaneously in the same area without fear of duplication, (2) they provide a more easily inspected criterion of accomplishment, (3) they create conditions promoting specialization, and (4) basic research is free from practical demands. Researchers favoring this style are more likely to describe themselves as "scholars" and "scientists." Researchers favoring the disadvantageous styles of non-basic, applied, theoretical, "soft" research tend to describe themselves as "teachers." Researchers who combine both styles tend to describe themselves either as "professionals" or "intellectuals." A conclusion is that differentiation among researchers based on advantages in competition of their styles of research is paralleled by a differentiation among scientific self-images. (Author/KC)

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STYLES OF RESEARCH AND SCIENTIFIC SELF-IMAGES OF RESEARCHERS IN FOUR SOCIO-BEHAVIORAL FIELDS

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Presented at the Society For Social Studies Of Science, Symposia: Social-Psychological Perspectives On Research Style And Career Development. Third Annual Meeting, Indiana University, Bloomington, November 3-5, 1978.

SO-011337

Styles of Research and Scientific Academic Self-Images
of Researchers in Four Socio-Behavioral Fields

Introduction

This paper has attempted to identify scientific self-images which characterize researchers on various styles of research in four socio-behavioral fields (sociology, psychology, political science and education) and to compare the identified self-images across the fields. By identifying the scientific self-images which are likely to characterize a given field's researchers on favored competing styles of research, the paper has sought to test the theory of competition as it applies to styles of research in these four socio-behavioral fields.

Because of the various meanings given to styles of research and to scientific self-images, one needs to make clear at the outset, that the styles of research to which this paper refers to are the following: basic, non-basic, applied, non-applied, theoretical, experimental, "hard"-methodology, "soft"-methodology. The scientific academic self-images to which the paper refers are: the "scholar," "scientist," "teacher," "intellectual," "professional."

With the exception of directly relevant sub-fields as general areas of consensus, few structural features in a given field seem to be as central as styles of research in forming areas of consensus and intellectual groupings. Styles of research can thus be viewed as paradigms, since they provide structures encompassing beliefs, values, techniques (T. Kuhn, 1970:175). They could be considered what M. Masterman (1970) would term as sets of "scientific habits." For socio-behavioral researchers styles of research serve as media of profound scientific expression which get reflected in their scientific self-identity. As a consequence, styles of research have a distinctive role in the process of formulating the researcher's scientific self-images.

T. S. Kuhn's work in 1962 made obvious the fact that paradigms are inherently guided by the image researchers have of themselves. This idea has been well articulated in R. Friedrichs' arguments (1970) on the dynamics of paradigmatic changes in sociology. Friedrichs supported and augmented Kuhn's thesis that scientific revolutions hinge upon shifts in the fundamental images which researchers have of the subject matter. He contends that a social science may have to confront a more fundamental paradigmatic dimension, "a level that addresses itself to the gounding image the social scientist has of himself as a scientific agent" (1970:55). R. Merton (1973:520) thought that "interaction between developing self-images" among others reasons, led researchers to adopt one or another styles of research or "sub-roles" as he identified them.

Merton connotes, psychologistic connotations to the term "self-image," namely a personality trait which has an influence on one's choices of styles of research. More conspicuous in this approach, however, without mentioning the term self-image, has been I. Mitroff's (1974) formulation of styles of research typology in natural sciences from Jung's typology of personality. In the present paper the conceptual approach has been different; styles of research were viewed as factors accounting for scientific self-images while the latter, which serve as role typifications, are different from personality self-images, though they are incorporated in them.

The Theory of Competition in Scientific Community and Styles of Research

R. Merton (1968; 1973) and W. Hagstrom (1965) argued that science was a competitive activity, through the thesis of social control in science. J. Ben-David (1960; 1966) and R. Collins (1968) had earlier articulated the arguments on the theory of competition in science in a more explicit and focused way. The former applied the theory to explain various historical cases of science; the latter attempted to synthesize the basic arguments into a comprehensive theoretical framework (1968).

The basic arguments for the theoretical framework as articulated by R. Collins can be summarized as follows: original knowledge gets produced but once and consequently is a scarce commodity, a condition which engenders competition among researchers. This is especially true when accompanied by professionalization of scientific activities and institutionalization of the evaluation and rewards systems by one's peers. The scientific community thus gains control over the "scientific recognition" given for what it considers original knowledge. Because original knowledge is a scarce commodity, scientific recognition given for producing original knowledge also becomes a scarce commodity for which researchers compete.

If science is viewed as a competitive activity, then intellectual and organizational components of science can be analyzed for their effects on the competition. For example, if certain scientific methods, theories, style of research, division of fields, have more advantages than others for competing researchers, socio-behavioral researchers will be expected to favor these methods, theories, styles of research, and division of fields.

The present paper applied this view to competitive activity among socio-behavioral researchers, expecting them to favor certain styles of research because they were considered more advantageous than others. In light of existing literature, one can maintain that basic, experimental, non-applied and "hard"-quantitative styles of research are generally likely to be more advantageous than non-basic, theoretical, applied and "soft"-qualitative, respectively, in competition (R. Collins, 1968; T. Kuhn, 1962; P. Kay, 1977; J. Habermas, 1971; D. Phillips, 1973, et al.).

The reasons for identifying the former styles of research as more advantageous than the latter can be summarized as follows:

1. Experimental, and "hard"-quantitative styles enable a larger number of researchers to work simultaneoulsy in the same area without concern about duplicating each other's work.
2. Experimental and "hard"-quantitative styles of research provide a more easily inspected criterion of accomplishment than do their theoretical and "soft"-qualitative styles counterparts.
3. Experimental and "hard"-quantitative styles of research have more advantages for competitors since they create conditions promoting specialization which enhances employment for a wide range of manpower.
4. R. Collins maintained that basic reaearch by its freedom from practical demands provides the best competitive situation. Basic research can thus evolve in the most favorable direction for competition among all its members, whereas applied research gets circumscribed by the concerns of employers.

Styles of Research and Self-Images

Based on the scientific skills and on the expectations of the audiences to which they address themselves, the "scientist" and "scholar" self-images are likely to typify the self-identity of researchers in the four fields, who favor the advantageous styles of research. Both self-images imply working with empirical data and "hard"-quantitative skills addressing themselves primarily to an audience formed mostly of peers. The "scientist" self-image thus explicitly implies "hard"-quantitative experimental skills more than the "scholar" self-image.

In contrast to the "scientist" and "scholar," the "teacher" self-image is likely to typify better than other self-images the self-identity of researchers of the four fields who favor the more disadvantgeous styles of research. The "teacher" self-image connotes skills to systematized didactic knowledge; it implies non-experimental skills and often a more qualitative methodology. This

self-image tends to identify itself with an audience formed mostly of students or other non-peer audiences.

The "professional" and the "intellectual" self-images are expected to typify the self-identity of researchers who favor both groupings of styles. However, these latter two self-images are likely to typify the self-identity of opposing types of researchers. The former typifies the practical application of skills and knowledge, with teaching as one of such application. This is especially applicable in socio-behavioral sciences in which less well defined and institutionalized ex-academic socio-behavioral researchers or institutions consume the knowledge produced by the "professionals" in academe. The "professional" self-image might be an ascending one in a period of increasing dependency on federal funds. In such periods many socio-behavioral "scientists" and "scholars" might perform many "professional" stylistic elements.

The "intellectual" self-image should typify what J. P. Nettle termed: "a concern for broad structural rearrangements according to universal principles" (E. Ladd and S. Lipset, 1975:71). The differentiation of research within a field into a variety of highly particularistic specialties and their associated quantitative-empirical skills are increasingly expected to be utilized by researchers who can compete favorably. This situation does not make the "intellectual" a popular self-image among researchers who are favoring the more successfully competing styles of research. To the contrary, this traditional self-image of academics appears currently in decline and often gets associated with teaching, though many "scholars" and "scientists" perform "intellectual" stylistic elements.

At this point a comprehensive proposition can be generated to associate the two groupings of styles of research and scientific self-images. The proposition could be formulated as follows: basic, non-applied, experimental and

"hard"-oriented researchers, are more likely to describe themselves as "scholars" and "scientists" than their counterparts, namely, non-basic, applied, theoretical and "soft"-oriented researches, who are more likely to describe themselves as "teachers." Researchers of both groupings of style are likely to describe themselves as either "intellectuals" or "professionals." Thus researchers attracted by certain styles are likely to describe themselves as "intellectuals." Their counterparts who, attracted by opposite styles, are likely to describe themselves as "professionals" and vice versa.

The Data

The study which evolved to test this proposition was based on a secondary analysis of selected data collected by E. Ladd and S. Lipset in their 1975 "Survey of the American Professoriate." This stratified, national sample contained responses from 646 socio-behavioral academicians: 98 sociologists, 255 educators, 105 political scientists and 188 psychologists. The working sample in the parental study was comprised of 3,536 responsdents, drawn from a stratified sample of higher education institutions and scientific fields in the U.S.

"Styles of research" were conceptualized as independent variables with the "scientific self-images" conceptualized as dependent variables. The independent variable included seven items from the Ladd-Lipset questionnaire to identify styles of research formulated in a dichotomic manner to characterize the researcher's style: (1) basic research or non-basic research (2) applied research or non-applied research (3) experimental research or theoretical research (4) "hard"-quantitative research or "soft"-qualitative research. These styles were formulated independently without any assumption that they served as a profile. The dependent variable items comprising the "scientiic self-images" as formulated in the parental survey were: "Some faculty are inclined to think of themselves as "intellectuals." Others find "scholar," "scientist," "teacher" or "professional" as more satisfactory descriptors which of these terms describes you best?".

The extent of observed relationahips between the independent and the dependent variables was determined in probability terms by the use of the chi-square test of homogeneity. The levelof significance was set at the .01 and .05 levels of probability to identify relationships which exceeded the bonds of chance fluctuation in their distributions.

The Findings

The relationships between dependent and independent variables which obtained statistical significance can be summarized as follows: (See appended Tables 1-4.)

1. The scientific self-images of the "scholar" and the "scientist" were more likely than others to describe the socio-behavioral researchers favoring the advantageous grouping of styles of research. A partial exception to this trend appeared among the non-applied and the experimental psychologists who were more likely to describe themselves as "scientists," but not as "scholars." In addition to the "scientist" and "scholar" self-images, the potentially advantaged researchers generally described themselves as either "intellectuals" or "professionals," but not as both. Psychologists in this category were more apt to describe themselves as "intellectuals" than as "professionals," except for the experimental psychologists who preferred to describe themselves as "professionals." In contrast, the sociologists in the same category were more likely to describe themselves more often as "professionals" than "intellectuals," and educators in the same category described themselves almost equally either "professionals" or "intellectuals."
2. The "teacher" either with the "professional," as most of psychologists tended to describe themselves, or with the "intellectual" as sociologists tended to describe themselves, were self-images more likely to describe researchers who favor the disadvantageous styles of research (i.e., non-basic, applied, theoretical and "soft"-qualitative research).

3. All findings in psychology attained statistical significance, indicating substantial relationships between styles of research and self-images. None of the findings in political science attained statistical significance. These findings suggest that styles of research in psychology seemed likely to account for scientific self-images whereas such relationship could not be inferred for political science.

In sociology and in education the findings attaining statistical significance were concentrated among those researchers favoring basic/non-basic and "hard"/"soft" styles of research. These findings suggest for these researchers, that styles of research in these fields are likely to account for scientific self-images.

Conclusions

The results obtaining statistical significance as cited above, mostly supported the basic proposition: Researchers favoring potentially advantageous styles of research in competition, such as basic research, non-applied research, experimental research and "hard"-quantitative research were more likely to describe themselves as "scientists," as "scholars" and either as "intellectuals" or "professional." Their counterparts, researchers favoring the more disadvantageous styles of research in competition such as, non-basic, applied, theoretical and "soft"-qualitative research more often described themselves as "teachers" and either as "intellectuals" or "professionals."

The findings tended to support the general assumption that differentiation among researchers based on advantages in competition of their styles of research was paralleled by a differentiation among scientific self-images. By supporting this assumption, the findings indicated that competition could be a dominant social mechanism with far reaching implication on the researcher's scientific self-identity.

The high percentages of psychologists, sociologists and educators favoring the advantageous styles of research and describing themselves as "scientists" and "scholars" indicate the coexistence in each of these fields of two stylistic sub-groups with a high degree of similarity. This was supported by their common advantages in competition. However, these sub-groups have also some degree of dissimilarity, at least enough to generate a different self-identity; this dissimilarity may well be related to the various forms of experimentation that "scientists" perform, in contrast to various forms of non-experimental empirical analyses that "scholars" perform. This speculative assertion needs further examination and support. At the same time, the polarized location of "professionals" and "intellectuals" suggests a great deal of dissimilarity in their skills and in the expectations of audiences to which these researchers address themselves. One might speculate that various socio-behavioral fields differ from each other by the proportion of their researchers who perceive themselves as "professionals" or "intellectuals" and by the combination of these two self-images with either the "scholar" and the "scientist" or with the "teacher."

The findings further indicated that in psychology all four contrasting styles of research were likely to account for the four scientific self-images in contrast to the field of political science in which none of the styles accounted for scientific self-images. In sociology and in education only basic/non-basic research and "hard"/"soft" research were helpful in accounting for scientific self-images.

These findings tend to strengthen arguments which have been put forward elsewhere (G. Haim, 1978) about conditions which facilitate competition based on styles of research in psychology and to a lesser degree in other socio-behavioral fields. The arguments are as follows:

1. The theory of competition in science which served as background for this study was originally formulated for the natural sciences. Natural sciences through their conspicious competition for priority in discovery and problem solving might provide a more appropriate population for study and contribute more to the theory of competition than do the socio-behavioral sciences. At the same time, insofar as the socio-behavioral sciences become professionalized, their socio-behavioral researchers compete for priority on what might be considered their scientific contributions. However, since in socio-behavioral fields the consensus and the criteria about what a scientific contribution is are loose and imprecise, the competition among these researchers as such is not yet forceful enough to acquire status as a significant social control mechanism.

   Psychology might be somewhat different from other socio-behavioral fields in this respect. With its biological components and mathematically adapted instruments this field might be closer to the prototype of the natural sciences than any of the other three socio-behavioral fields.

2. Psychology in contrast to other socio-behavioral fields seems to be more divided along styles of research than the other three socio-behavioral fields. The latter, especially political science, seemed more "area" or "phenomenon" oriented. Thus, examining the effects of competition on styles of research-self-images relationship might be more appropriate for psychology and less for other socio-behavioral fields with the possible exception of sociology and education which are also significantly enough divided along the basic/non-basic and "hard"/"soft" styles to generate competition and to account for self-images.

The findings of the study were congruent with the findings of the parental study in indicating the relationship between self-images and other academic

and scientific aspects (E. Ladd and S. Lipset, 1976). Thus, E. Ladd and S. Lipset reported that 69 percent of the "scientists" and 56 percent of the "scholars" among the entire sample expressed a preference for research over teaching. On the other hand, 95 percent of the "teachers" and 74 percent of the "professionals" expressed a heavier perference for teaching. Among the "intellectuals," 56 percent reported preference for teaching over research. The authors also reported that researchers who were highly productive were more likely to consider themselves to be "intellectuals," "scholars" or "scientists" than did the less productive researcher . . .

The present study should be followed by ethnomethodological studies inquiring into the fundamental meanings and constructs describing scientific self--images of researchers. One might suspect that a phenomenological situation of competition mobilizes and intensifies the researchers' self awareness of their self-identity qua researchers, in relation to other colleagues in the same field. Future research should concentrate more effort on ways in which social control mechanisms operate to produce behavioral phenomena within the scientific community and should especially concentrate on socio-behavioral fields whose development and changes seem to be fundamentally related to various behavioral aspects of their researchers.

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Appendum

Table I. Percentages of Basic and Non-Basic Researchers Reporting What Scientific-Academic Self-Image Describe Them the Best, by Field[a]

	Field											
	EDUCATION			POLITICAL SCIENCE			SOCIOLOGY			PSYCHOLOGY		
	Basic Researchers	Non-Basic Researchers		Basic Researchers	Non-Basic Researchers		Basic Researchers	Non-Basic Researchers		Basic Researchers	Non-Basic Researchers	
Self-descriptor	% (N)	% (N)	X^2	% (N)	% (N)	X^2	% (N)	% (N)	X^2	% (N)	% (N)	X^2
Intellectual	13.5 (37)	7.3 (179)	35.190**	22.9 (48)	10.6 (47)	5.886	13.3 (45)	16.7 (30)	10.853**	7.7 (104)	2.9 (70)	45.543**
Scholar	29.7 (37)	7.3 (179)		21.7 (48)	23.4 (47)		40.0 (45)	20.0 (30)		19.2 (104)	11.4 (70)	
Scientist	8.1 (37)	0 (179)		6.3 (48)	4.3 (47)		11.0 (45)	0 (30)		39.4 (104)	2.9 (70)	
Teacher	29.7 (37)	49.2 (179)		27.1 (48)	25.5 (47)		17.8 (45)	46.7 (30)		19.2 (104)	40.0 (70)	
Professional	18.9 (37)	36.3 (179)		16.4 (48)	36.2 (47)		17.8 (45)	16.7 (30)		14.4 (104)	42.9 (70)	

[a]Significance at .05 has been indicated by a single asterisk (*) and at .01 has been indicated by a double asterisk (**). Other Chi-square values are non-significant.

[b]In this and subsequent tables the N's which follow the percentages indicate the total size of that subgrouping, the percentage being computed on that N within the total for the socio-behavioral field. The Chi-square analysis thus establishes the extent to which chance expectation can account for the pattern reflected in the 2x2 table as analyzed. The N's for the 2x2 table can be reconstituted from the percentage and N for each subgroup if needed.

Table 2. Percentages of Applied and Non-Applied Researchers Reporting What Scientific-Academic Self-Image Describe Them the Best, by Field[a]

	Field											
	EDUCATION			POLITICAL SCIENCE			SOCIOLOGY			PSYCHOLOGY		
	Applied Researchers	Non-Applied Researchers		Applied Researchers	Non-Applied Researchers		Applied Researchers	Non-Applied Researchers		Applied Researchers	Non-Applied Researchers	
Self-descriptor	% (N)	% (N)	X^2	% (N)	% (N)	X^2	% (N)	% (N)	X^2	% (N)	% (N)	X^2
Intellectual	7.4 (175)	11.6 (43)	7.092	8.2 (49)	25.5 (47)	6.274	13.5 (37)	15.8 (38)	2.759	5.3 (114)	6.8 (59)	25.325**
Scholar	9.1 (175)	18.6 (43)		24.5 (49)	25.5 (47)		21.6 (37)	15.8 (38)		32.5 (114)	13.6 (59)	
Scientist	17.0 (175)	0 (43)		6.1 (49)	4.3 (47)		29.7 (37)	34.2 (38)		13.2 (114)	22.0 (59)	
Teacher	44.6 (175)	48.8 (43)		28.6 (49)	25.5 (47)		2.7 (37)	10.5 (38)		15.8 (114)	44.1 (59)	
Professional	37.1 (175)	20.9 (43)		32.7 (49)	19.1 (47)		32.4 (37)	23.7 (38)		33.3 (114)	13.6 (59)	

[a]Significnace at .05 level has been indicated by a single asterisk (*) and at .01 level has been indicated by a double asterisk (**). Other Chi-square values are non-significant.

Table 3. Percentages of Theoretic and Substantive-Experimental Researchers Reporting What Scientific-Academic Self-Image Describe Them the Best, by Field[a]

	Field											
	EDUCATION			POLITICAL SCIENCE			SOCIOLOGY			PSYCHOLOGY		
	Theoretical Researchers	Substantive-Experimental Researchers		Theoretical Researchers	Substantive-Experimental Researchers		Theoretical Researchers	Substantive-Experimental Researchers		Theoretical Researchers	Substantive-Experimental Researchers	
Self-descriptor	% (N)	% (N)	χ^2	% (N)	% (N)	χ^2	% (N)	% (N)	χ^2	% (N)	% (N)	χ^2
Intellectual	11.5 (26)	5.6 (107)	3.744	14.3 (21)	14.6 (48)	2.102	23.1 (26)	14.3 (42)	2.999	15.4 (29)	5.3 (120)	10.451**
Scholar	19.2 (26)	12.1 (107)		19.0 (21)	25.0 (48)		34.6 (26)	35.7 (42)		23.1 (29)	15.9 (120)	
Scientist	0 (26)	2.8 (107)		9.5 (21)	4.2 (48)		3.8 (26)	4.8 (42)		7.7 (29)	28.3 (120)	
Teacher	46.2 (26)	43.0 (107)		38.1 (21)	27.1 (48)		15.4 (26)	31.0 (42)		38.5 (29)	23.0 (120)	
Professional	23.1 (26)	36.4 (107)		19.0 (21)	29.2 (21)		23.1 (26)	14.3 (42)		15.4 (29)	27.4 (120)	

[a]Significance at .05 level has been indicated by a single asterisk (*) and at .01 level has been indicated by a double asterisk (**). Other Chi-square values are non-significant.

Table 4 Percentages of "Hard" and "Soft" Researchers Reporting What Scientific-Academic Self-Image Describe Them the Best, by Field[a]

	Field											
	EDUCATION			POLITICAL SCIENCE			SOCIOLOGY			PSYCHOLOGY		
Self-descriptor	"Hard," "Rigorous," Scientific Researchers % (N)	"Soft," "Qualit.," Humanistic Researchers % (N)	χ^2	"Hard," "Rigorous," Scientific Researchers % (N)	"Soft," "Qualit.," Humanistic Researchers % (N)	χ^2	"Hard," "Rigorous," Scientific Researchers % (N)	"Soft," "Qualit.," Humanistic Researchers % (N)	χ^2	"Hard," "Rigorous," Scientific Researchers % (N)	"Soft," "Qualit.," Humanistic Researchers % (N)	χ^2
Intellectual	13.5 (89)	4.4 (132)	19.591**	15.5 (58)	21.1 (38)	8.626	10.0 (50)	25.0 (28)	21.000**	6.1 (131)	4.2 (48)	29.041**
Scholar	14.6 (89)	7.6 (132)		31.0 (58)	15.8 (38)		42.0 (50)	10.7 (28)		18.3 (131)	8.3 (48)	
Scientist	3.4 (89)	0 (132)		8.6 (58)	0 (38)		10.0 (50)	0 (28)		32.8 (131)	2.1 (48)	
Teacher	31.5 (89)	56.1 (132)		19.0 (58)	36.8 (38)		16.0 (50)	53.6 (28)		20.6 (131)	50.0 (48)	
Professional	37.1 (89)	31.8 (132)		25.9 (58)	26.3 (38)		22.0 (50)	10.7 (28)		22.1 (131)	35.4 (48)	

[a]Significance at .05 level has been indicated by a single asterisk (*) and at .01 level has been indicated by a double asterisk (**). Other Chi-square values are non-significant.